What is claimed is:

1. An organic/inorganic hybrid hydrogel in which water (C) is contained in a three-dimensional network formed by hybridization of: a water soluble polymer (A) and a water swelling clay mineral (B) which can be homogeneously dispersed in water.

2. An organic/inorganic hybrid hydrogel according to claim 1, wherein said organic/inorganic hybrid hydrogel is obtained by polymerization of a monomer (A') which is a constituent of the water soluble polymer (A) in the presence of the water swelling clay mineral (B) and water (C).

3. An organic/inorganic hybrid hydrogel according to claim 1 and claim2, wherein the weight ratio of the water swelling clay mineral (B) to the water soluble polymer (A) is within a range of 0.01 to 10.

4. An organic/inorganic hybrid hydrogel according to claim 1 and claim 2, wherein said water soluble polymer (A) includes polymers obtained by polymerization of acrylamide derivatives and/or methacrylamide derivatives.

5. An organic/inorganic hybrid hydrogel according to claim 1, wherein said organic/inorganic hybrid hydrogel has a critical temperature (Tc) and the state of said organic/inorganic hybrid hydrogel is reversibly changeable between the transparent and/or a volume swollen state below the critical temperature, and the opaque and the volume shrunken state above the critical temperature.

6. An organic/inorganic hybrid hydrogel according to claim 5, wherein the ratio of the volume of said organic/inorganic hybrid hydrogel in water below the critical temperature is more than 10 times larger to that above the critical temperature.

7. An organic/inorganic hybrid hydrogel according to claim 1, wherein the tensile load at break is equal to or more than 0.1N, the tensile elongation at break is equal to or more than 100%, and the load when the tensile elongation is 100% is more than 0.01N in the case that said organic/inorganic hybrid hydrogel has a water content defined by {C/(A+B)} of 600 to 1000 weight % and whose initial sectional area is 0.237 cm^2.

8. An organic/inorganic hybrid hydrogel according to claim 1, wherein the water content of {Cmax/(A+B)} at the equilibrium swollen state is equal to or more than 2000 weight %.

9. An organic/inorganic hybrid hydrogel according to claim 1, wherein a total transmission in the visible light range is equal to or more than 80 % in the case of using a 25 mm thick sample of said organic/inorganic hydrogel containing water (C) at 10 times (weight basis) higher than the content of an organic polymer (A).

10. A dry gel body of an organic/inorganic hybrid hydrogel obtained by drying said organic/inorganic hybrid hydrogel according to claim 1.

11. An electrophoresis medium comprised of an organic/inorganic hybrid hydrogel according to claim 1.

12. An aqueous solution absorbent material comprised of said organic/inorganic hybrid hydrogel according to claim 1 and/or said dry gel body of the organic/inorganic hybrid hydrogel according to claim 10.

13. A manufacturing method for an organic/inorganic hybrid hydrogel comprising the steps of:

preparing a homogeneous solution containing (A') which corresponds to a monomer of a water soluble polymer (A), a water swelling clay mineral (B) which can be homogeneously dispersed in water, and water (C); and

polymerizing the monomer (A') under the presence of the clay mineral (B).

14. A manufacturing method for an organic/inorganic hybrid hydrogel according to claim 12, wherein said homogeneous solution containing (A'), (B), and (C) further comprises an organic solvent which is miscible with water.

15. A manufacturing method for an organic/inorganic hybrid hydrogel according to claim 13, wherein the weight ratio of the water swelling clay mineral (B) to the monomer (A') of the water soluble polymer (A) is within a range of 0.01 to 10.

16. A manufacturing method for an organic/inorganic hybrid hydrogel according to claim 13, wherein said monomer (A') of the water soluble polymer (A) includes acrylamide derivatives and/or methacrylamide derivatives.

17. A manufacturing method for an organic/inorganic hybrid hydrogel according to claim 13, wherein said organic/inorganic hybrid hydrogel has a critical temperature (Tc),

at which the organic/inorganic hybrid hydrogel changes reversibly between the transparent and swollen state at a lower temperature of the critical temperature and an opaque and shrunken state at a higher temperature of the critical temperature.

18. A manufacturing method for an organic/inorganic hybrid hydrogel according to claim 17, wherein the volume ratio of said organic/inorganic hybrid hydrogel in water below the critical temperature to that above the critical temperature is equal to 10 or more.

19. A manufacturing method for an organic/inorganic hybrid hydrogel according to claim 13, wherein said organic/inorganic hybrid hydrogel provided by said manufacturing method has a tensile load at break of more than 0.1N, a tensile elongation at break of more than 100%, and a load at a tensile elongation of 100% is more than 0.01N in the case of using said organic/inorganic hybrid hydrogel, having a water content defined by {C/(A+B)} is 600 to 1000 weight %, for a sample which has an initial sectional area is 0.237 cm^2.

20. A manufacturing method for an organic/inorganic hybrid hydrogel according to claim 13, wherein the water content defined by {Cmax/(A+B)} of said organic/inorganic hybrid hydrogel in the equilibrium swollen state is equal to or more than 2000 weight %.

21. A manufacturing method for an organic/inorganic hybrid hydrogel according to claim 13, wherein a total transmission in the visible range of said organic/inorganic hybrid hydrogel is more than 80 %, when a 25 mm thick sample of said organic/inorganic hydrogel containing water (C) at 10 times (weight basis) higher than

the content of an polymer (A) is used.